REMARKS

Claims 1-12 and 16-27 are pending in this application. No claims have been allowed.

Title:

The Examiner has stated that the title is not descriptive and that a new title is required that is clearly indicative of the invention to which the claims are directed. The title has been amended to "A Method of Fabricating a Composite Apparatus."

35 U.S.C. 103

The Examiner has rejected claims 1-12 and 16-27 as being unpatentable over Oakley et al. (U.S. Patent 6,088,894) in view of Lazarus et al. (U.S. Patent 6,404,107). The Examiner asserts:

> *As per claims 1 and 16, Oakley et al. teach a process of fabricating a piezoelectric composite element comprising steps of: providing a plurality of wafers of piezoelectric material (82); bonding the wafers together with an adhesive material (84) to form a stack of alternating layers of piezoelectric material and adhesive material, the stack having a thickness as shown in Figs. 6(a) and (b); cutting through the stack in a direction substantially parallel to the thickness of the stack and across the alternating layers of piezoelectric material and adhesive material to provide at least one piezoelectric fiber sheet comprising a plurality of piezoelectric fibers (88) in juxtaposition to adhesive material, the at least one piezoelectric fiber sheet having a first side and a second side as shown in Fig. 6(c); providing a first film (90, top portion) and a second film (90, bottom portion) as shown in Fid. 6(d); bonding the second film to the second side of the at least one piezoelectric fiber sheet as shown in Fig. 6(e); and bonding the first film to the first side of the at least one piezoelectric fiber sheet as shown in Fig. 6(e) (see also col. 11, lines 28-65).*
>
> *As per claims 2 and 17 the wafer of piezoelectric material comprises a monolithic piezoelectric material (PZT).*
>
> *As per claims 3 and 18 each piezoelectric fiber has a substantially rectangular cross-section as shown in Fig. 6(c).*
>
> *As per claim 8 the first film and the second film each have a longitudinally extending axis and the step of cutting produces at least one piezoelectric sheet having a plurality of piezoelectric fibers that extend in the direction of the longitudinal axes of the first and second films as shown in Fig. 6(d).*
>
> *However, Oakley et al. fail to teach the first film having a first conductive pattern and a second conductive pattern formed thereon, the first conductive pattern being electrically isolated form the second conductive pattern, the first and second conductive patterns each having a plurality of electrodes that cooperate to form a pattern of*

interdigitated electrodes such that the conductive patterns of the first film electrically contact the piezoelectric fibers of the at least one piezoelectric fiber sheet. Lazarus et al. teach a process of fabricating a piezoelectric compositing element including a process of forming a first film (412) and a second film (414, as per claims 5 and 20), wherein a piezoelectric element (404) is located therebetween the first film and second film as shown in Fig. 10C. The first film, and the second film include a first conductive pattern (402) and second conductive pattern (402) formed thereon and the first conductive pattern being electrically isolated from the second conductive pattern and the first and second conductive patterns each having a plurality of electrodes that cooperate to form a pattern of interdigitated electrodes (408) such that the conductive patterns of the first film electrically contact the piezoelectric element (404) of the at least one piezoelectric fiber sheet. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the first and second conductive films of Oakley et al. by a first film and a second film including a first conductive pattern and a second conductive pattern having a plurality of electrodes that cooperate to form a pattern of interdigitated electrodes as taught by Lazarus et al.

It is respectfully submitted that there is no basis in the art for combining or modifying the references. MPEP §2143.01 provides:

> *The mere fact that references <u>can</u> be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.*

Accordingly, even if all the elements of a claim are disclosed in various prior art references, the claimed invention taken as a whole cannot be said to be obvious without some logical reason given in the prior art why one of ordinary skill would have been prompted to combine the teachings of the references to arrive at the claimed invention. Neither reference cited by the Examiner suggests explicitly or implicitly that the first or second films taught by the other reference be used. Further, *Oakley et al.* teaches a d31 device, whereas *Lazarus et al.* teaches a d33 IDE (interdigitated electrodes) monolithic device. Because *Oakley et al.* and *Lazarus et al.* are directed to different types of devices, it would not have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the first and second conductive films of *Oakley et al.* by a first film and a second film including a first conductive pattern and a second conductive pattern having a plurality of electrodes that cooperate to form a pattern of interdigitated electrodes as taught by *Lazarus et al.* As *Oakley et al.* and *Lazarus et al.* take different approaches, it would not be obvious/logical to one skilled in the art to combine them.

CONCLUSION

In view of the above Remarks, the Applicants submit that all pending claims in the instant application are in condition for allowance. The Applicants respectfully request an early action to this end.

Respectfully submitted,

January 31, 2006
Date

Robin W. Edwards

Robin W. Edwards
Registration No. 39.179
NASA Langley Research Center
Mail Stop 141
Hampton, VA 23681-2199
757-864-3230 (voice)
757-864-9190 (facsimile)
Customer No. 23351

23351